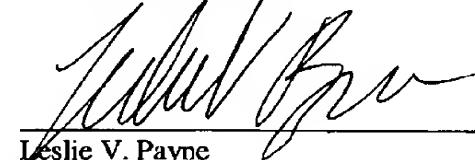


Claims 1-17, 19-21, 30-36, 39-41, 43, 44, 46, 47 and 49 have been amended. A marked up version of the amended claims is appended hereto in which the changes are indicated by underlining the added text and striking out the deleted text.

Conclusion

If the Examiner has any questions or comments regarding the foregoing, he is requested to telephone the undersigned. If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Deposit Account Number 03-2769 of Conley, Rose & Tayon, P.C., Houston, Texas.

Respectfully submitted,



Leslie V. Payne
Reg. No. 38,267
Conley, Rose & Tayon, P.C.
P. O. Box 3267
Houston, Texas 77253-3267
(713) 238-8000
ATTORNEY FOR APPLICANT

79645 01/1894.00501

MARKED-UP VERSION OF CLAIM AMENDMENTS

1. (Amended) A method of degrading a predetermined substrate comprising:
~~formulating~~~~providing~~ a fluid or a soliddevice containing a ~~degradable~~ substrate and ~~an~~
~~substrate-degrading~~ agent inactivated by sequestration, said inactivated substrate-
degrading agent being substantially unreactive under normal conditions of
use of said fluid or solid or mixture thercof, and becoming active in responsive to a predetermined
triggering signal that is not present under said normal conditions of use; and
applying ~~asaid~~ triggering signal, other than a change in temperature or mechanically
crushing by closing fractures, to said fluid or soliddevice such that said substrate-degrading agent
becomes activated upon exposure to ~~thesaid~~ triggering signal, the activated substrate-degrading
agent being capable of degrading the substrate under degradation promoting conditions.
2. (Amended) The method of claim 1 further comprising ~~encapsulating said degrading wherein~~
~~said sequestration comprises encapsulation of said substrate-degrading~~ agent to provide an
inactivated substrate-degrading agent.
3. (Amended) The method of claim 21 wherein the step of applying a triggering signal
comprises exposing the inactivated substrate-degrading agent to a stimulus selected from the group
consisting of exposure to a reducing agents, ~~oxidizers, chelating agents, radical initiators, agent,~~
~~oxidizer, chelating agent, radical initiator~~, carbonic acid, ozone, chlorine, bromine, peroxide,
electric current, ultrasound, change in pH, change in salinity, change in ion concentration, ~~change~~
~~in temperature and change in pressure, said inactivated degrading agent being capable of physically~~
~~and/or chemically responding to said stimulus and change in pressure other than mechanically~~
~~crushing by closing fractures~~.
4. (Amended) The method of claim 1 wherein said step of applying a triggering signal
comprises exposing the inactivated substrate-degrading agent to a change in pH environment.
5. (Amended) The method of claim 4 wherein said step of exposing the inactivated substrate-
degrading agent to a change in pH comprises ~~establishing an acid lowering the pH~~ environment.

6. (Amended) The method of claim 5 wherein said step of establishing an acid lowering the pH environment comprises exposing the inactivated substrate-degrading agent to carbonic acid.
7. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in salinity.
8. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a reducing agent.
9. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to an oxidizer.
10. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a chelating agent.
11. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a radical initiator.
12. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to ozone.
13. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to chlorine or bromine.
14. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to peroxide.
15. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to an electric current.
16. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to ultrasound.

17. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in ion concentration.

19. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in pressure other than mechanically crushing by closing fractures.

20. (Amended) The method of claim 1 wherein said substrate-degrading agent comprises at least one enzyme having activity for degrading said substrate under degradation promoting conditions, agent chosen from enzymes, microorganisms, spores and inorganic chemicals.

21. (Amended) The method of claim 220 further comprising wherein said sequestration comprises encapsulating said at least one enzymesubstrate-degrading agent with an encapsulating material that maintains the substrate-degrading agent substantially unreactive under normal conditions of use of said fluid or solid or mixture thereof, and is responsive to said triggering signal such that at least a portion of said enzymesubstrate-degrading agent is released by said encapsulating material upon exposure to asaid triggering signal.

30. (Amended) The method of claim 21 wherein the fluid or solid device comprises at least two inactivated enzymesubstrate-degrading agents, wherein the inactivated enzymesubstrate-degrading agents are capable of being reactivated by the same or different triggering signals, such that upon reactivation the reactivated enzymesubstrate-degrading agents are capable of acting upon the same or different substrates independently or in concert.

31. (Amended) The method of claim 21 wherein said at least one enzymesubstrate-degrading agent comprises an endo-amylase.

32. (Amended) The method of claim 3421 wherein said at least one enzyme comprises substrate-degrading agent is alpha-amylase.

33. (Amended) The method of claim 21 wherein the substrate-degrading agent comprises an enzyme is selected from the group consisting of exo-amylases, isoamylases, glucosidases, amylo-glucosidases, malto-hydrolases, maltosidases, isomalto-hydrolases and malto-hexaosidases.

34. (Amended) The method of claim 21 wherein the reactivated enzyme released substrate-degrading agent is capable of being activated by application of a second triggering signal, wherein the second triggering signal may be the same or a different triggering signal, such that the inactivated substrate-degrading agent enzyme no longer acts on the substrate.

35. (Amended) The method of claim 1 wherein the degradable substrate is selected from the group consisting of celluloses, derivatized celluloses, starches, derivatized starches, xanthans and derivatized xanthans.

36. (Amended) The method of claim 1 wherein the fluid is chosen from the group consisting of circulating drilling fluid, completion fluid, stimulation fluid, gravel packing fluid and workover fluid.

39. (Amended) The method of claim 1 wherein said solid device comprises at least one degradable polymer and an activatable inactivated enzyme fashioned into hardware a device or particle suitable for use downhole or on the surface for hydrocarbon exploitation.

40. (Amended) A method of increasing the flow of hydrocarbons from a well, the method comprising:

formulating providing a fluid comprising a degradable polymeric substrate and a substrate-degrading agent inactivated by sequestration, said inactivated substrate-degrading agent being substantially unreactive under the normal conditions of use of the fluid or solid or mixture thereof, and becoming active in responsive to a predetermined triggering signal not present under said normal conditions of use, and said inactivated substrate-degrading agent being responsive to a predetermined triggering signal on inactivated enzyme;

introducing the fluid into a downhole environment; and,

applying a triggering signal to other than a change in temperature or mechanically crushing by closing fractures on the fluid, the triggering signal being sufficient to reactivate the inactivated enzyme to give a reactivated enzyme substrate-degrading agent,

the reactivated enzyme substrate-degrading agent being capable of selectively degrading the substrate sufficient to alter a physical property of the fluid or a solid formed therefrom such that the flow of hydrocarbons from said well is increased.

41. (Amended) The method of claim 40 comprising:

carrying out drilling activity wherein said fluid comprises a circulating drilling fluid containing an enzyme-degradable substrate and an inactivated enzyme that is capable of withstanding the dynamic environmental conditions generating while drilling; and
wherein the step of introducing the fluid into a downhole environment comprises forming a filter cake forming a low-permeability filter cake or fluid invasion containing said degradable substrate and said inactivated enzyme, said low-permeability filter cake or fluid invasion retaining low-permeability until receipt of said triggering signal sufficient to reactivate at least a portion of said enzyme.

43. (Amended) The method of claim 40 wherein the fluid is chosen from the group consisting of a circulating drilling fluid, a completion fluid, a workover fluid, a fracturing fluid, a gravel packing fluid and a stimulation fluid.

44. (Amended) A method of degrading filter cake, the method comprising:

formulating providing a fluid comprising a polymeric viscosifier or fluid loss control agent

and an enzyme inactivated enzyme;

by sequestration, said inactivated enzyme being responsive to a predetermined triggering signal;

introducing the fluid into a downhole environment such that a filter cake containing said polymeric viscosifier or fluid loss control agent and said inactivated enzyme is formed;

applying a triggering signal to the fluid, the triggering signal being sufficient other than a change in temperature or mechanically crushing by closing fractures to reactivate the inactivated enzyme to give a reactivated enzyme,

the reactivated enzyme being capable of selectively degrading said polymeric viscosifier or fluid loss control agent such that said filter cake containing said viscosifier or fluid loss control agent at least partially disintegrates.

45. The method of claim 44 further comprising dislodging a piece of drilling equipment from said at least partially disintegrated filter cake.

46. (Amended) A method of degrading a contaminant arising from a subterranean formation comprising:

~~formulating~~providing a fluid comprising ~~an~~ substrate-degrading agent inactivated by sequestration, said inactivated substrate-degrading agent; ~~being responsive to a predetermined triggering signal;~~

introducing the fluid into a downhole environment that may contain a predetermined contaminant that is a substrate capable of being degraded by ~~the~~said substrate-degrading agent under degradation promoting conditions; and

~~applying a triggering signal to, other than a change in temperature or mechanically crushing by closing fractures on~~ the fluid, either by direct action or by the action of the contaminant, the triggering signal being sufficient to reactivate the inactivated substrate-degrading agent to give a reactivated agent,

allowing the reactivated substrate-degrading agent to degrade the contaminant.

47. (Amended) The method of claim 46 wherein the fluid is a circulating drilling fluid, completion fluid, gravel packing fluid or workover fluid.

49. (Amended) A wellbore treatment method comprising:

~~formulating~~providing a fluid or a solid~~device~~ containing ~~an~~ substrate-degrading agent ~~inactivated by sequestration, said~~ inactivated substrate-degrading agent, ~~said~~ inactivated agent being responsive to a predetermined triggering signal such that ~~said~~ substrate-degrading agent becomes activated upon exposure to ~~the~~said triggering signal, the activated substrate-degrading agent being capable of degrading ~~the~~said substrate under degradation promoting conditions;

introducing ~~the~~said fluid or solid into a downhole environment containing a predetermined substrate capable of being degraded by the agent under degradation promoting conditions;~~said substrate; and~~

~~providing the trigger~~said trigger signal, other than a change in temperature or mechanically crushing by closing fractures, to activate the substrate-degrading agent; and

allowing the substrate-degrading agent to degrade the substrate.